

Application No.: 10/589,382
Amendment and Response dated January 26, 2009
Reply to Final Office Action of October 30, 2008
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REMARKS/ARGUMENTS

Claims 1, 2, 4, and 6-12 are currently pending in this application. Claim 1 has been amended. Claim 12 has been cancelled. Applicants respectfully request reconsideration in view of the above amendments and the following remarks.

Applicants' Response to 35 U.S.C. §103 Rejection over Ota in view of Bingel

Claims 1, 2, 4, 6-9, 11 and 12 are rejected under 35 U.S.C. § 103(a) as allegedly being obvious Japanese Patent No. JP 11-109613 to Ota et al. (hereinafter "Ota") in view of U.S. Patent No. 5,739,376 to Bingel (hereinafter "Bingel"). Applicants respectfully submit that the combination of references fails to render the claims, as amended herein, *prima facie* obvious.

The Examiner alleges that:

Ota teaches a positive photoresist composition containing a fullerene derivative soluble in a solvent for a resist, a photoacid generator and an acid-labile resin. Ota also teaches a negative photoresist composition containing a fullerene derivative, a photoacid generator, an alkali-soluble resin and a crosslinking compound. Ota also teaches the use of organic solvent as well as various additive agents such as acid diffusion controlling agent. Ota teaches present patter-forming method.

(Office Action of 10/30/2008, at pages 2-3) (citations omitted).

The Examiner then alleges the following in regards to the fullerene derivative as described in paragraph [0011] of Ota:

For this compound, present "n" would be 1 and thus does not teach present "n" value of two or more. Bingel teaches the equivalence of a fullerene derivative having one malonic ester residue and a fullerene derivative having two or more malonic ester residues in terms of improving solubility and polarity of the fullerene derivatives. Based on this teaching of equivalency in terms of providing improved solubility and polarity of the fullerene derivatives, it would have been obvious to one skilled in the art to obtain Ota's fullerene derivative having two or more malonic ester residues. Thus, Ota in view of Bingel would render obvious

present inventions of claims 1, 2, 4, 6-9 and 11.

(Office Action of 10/30/2008, at page 3) (citations omitted).

The Examiner further asserts that:

With respect to claim 12, Ota teaches equivalence of the $-\text{COOC}_2\text{H}_5$ group and $-\text{COO-t-butyl}$. Based on Ota's such teaching in view of Bingel's teaching, it would have been obvious to one skilled in the art to obtain Ota's fullerene derivative having two malonic ester residue groups having t-butyl groups (instead of ethyl groups) with a reasonable expectation of success. Thus, Ota in view of Bingel would render obvious present invention of claim 12.

(Office Action of 10/30/2008, at pages 3-4) (citations omitted).

Claim 1 has been amended to further distinguish the present invention. In particular, the term "comprising" was replaced with "consisting essentially of" and a recitation was added to claim 1 requiring R^1 and R^2 to independently represent a tertiary alkyl group, which may be identical or different from each other. The term "a tertiary alkyl group" was taken from cancelled claim 12, which was searched in the previous office action, thus these amendments do should be entered.

Applicants respectfully submit that the Examiner's interpretation of Ota and Bingel in regards to claim 12 is incorrect. A fullerene derivative in which R^1 and R^2 are tertiary alkyl groups such as tert-butyl and a fullerene derivative in which R^1 and R^2 are primary or secondary alkyl groups such as C_2H_5 cannot be considered to be equivalents. Due to R^1 and R^2 being tertiary alkyl groups such as tert-butyl, which disassociate by way of the action of an acid generated from an acid generator, and then function as an acid dissociation dissolution-controlling group, a positive photoresist composition can be obtained in which the two major components are the fullerene derivative (A) and acid generator (B), as shown in paragraph [0034] of the instant specification.

In a case where R^1 and R^2 are primary or secondary alkyl groups such as C_2H_5 , in order to obtain a positive photoresist composition, it is necessary to employ the resin (C1) having an acid-dissociative dissolution controlling agent that increases solubility in alkali by the action of an acid. (See paragraphs [0036], [0037], [0046], and [0047] from the instant specification).

Ota discloses a positive radiation sensitive resist resin composition that contains:

- (A) a fullerene derivative n of 1;
- (B) a radiation sensitive acid generating agent; and
- (C) (i) an alkali insoluble or poor-alkali soluble resin that is protected by an acid dissociable group, the resin becoming alkali soluble when the acid dissociable group dissociates, or
- (C) (ii) an alkali-soluble resin and alkali solubility controlling agent.

In other words, according to Ota, the above-mentioned resin (C1) is required as an essential component. In contrast, Bingel in no way discloses a fullerene derivative having a specified structure used for resist composition. Accordingly, Ota and Bingel neither disclose nor suggest that, by using a fullerene derivative having R_1 and R_2 that are tertiary alkyl groups, a photoresist composition can be obtained in which the two major components are the fullerene derivative (A) and acid generator (B), and further, that this composition exhibits superior etching resistance, forms a finer pattern, and has superior effect that remarkably reduces edge roughness.

Therefore, adopting the fullerene derivatives disclosed in Bingel, into the resist composition of Ota is not obvious, nor would one of ordinary skill in the art combine the two with any reasonable expectation of success.

Each of the references, either alone or in combination, fails to render claims 1-9 and 11 obvious. As such, for the reasons expressed above, Applicants respectfully request

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reconsideration and withdrawal of the Section 103 rejection over Ota in combination with Bingel.

Applicants' Response to 35 U.S.C. §103 Rejection over Ota in view of Bingel and further in view of Sato

Claim 10 is rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Ota in view of Bingel and further in view of U.S. Patent No. 6,159,652 to Sato et al. (hereinafter "Sato"). Applicants respectfully submit that the combination of references fails to render the claims, as amended herein, *prima facie* obvious.

The Examiner alleges that:

Although Ota in view of Bingel does not teach present organic carboxylic acid, use of such compound in a photoresist composition is already known in the art to provide high sensitivity and high resolution for the composition. Thus, it would have been obvious to one skilled in the art to use an organic carboxylic acid in Ota's photoresist composition in order to provide high sensitivity and high resolution. Therefore, Ota in view of Bingel would render obvious present claim 10.

(Office Action of 10/30/2008, at page 4) (citations omitted).

Claim 10 depends upon claim 1. Each of the references, either alone or in combination, fails to render claim 1, or any that depend therefrom, obvious. As such, for the reasons expressed above, Applicants respectfully request reconsideration and withdrawal of the Section 103 rejection over Ota in view of Bingel and further in view of Sato.

Therefore, Applicants respectfully submit that claims 1, 2, 4 and 6-11, as presented in this amendment, are patentably distinct. This application is believed to be in condition for allowance.

Favorable action thereon is therefore respectfully solicited. Should the examiner have any questions or comments concerning the above, the examiner is respectfully invited to contact the undersigned attorney at the telephone number given below.

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The Commissioner is hereby authorized to charge payment of any additional fees associated with this communication, or credit any overpayment, to Deposit Account No. 08-2461. Such authorization includes authorization to charge fees for extensions of time, if any, under 37 C.F.R. § 1.17 and also should be treated as a constructive petition for an extension of time in this reply or any future reply pursuant to 37 C.F.R. § 1.136.

Respectfully submitted



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